

OpenTrack + SimWalk Transport
„Closing the gap“ between railway network
and passenger simulation

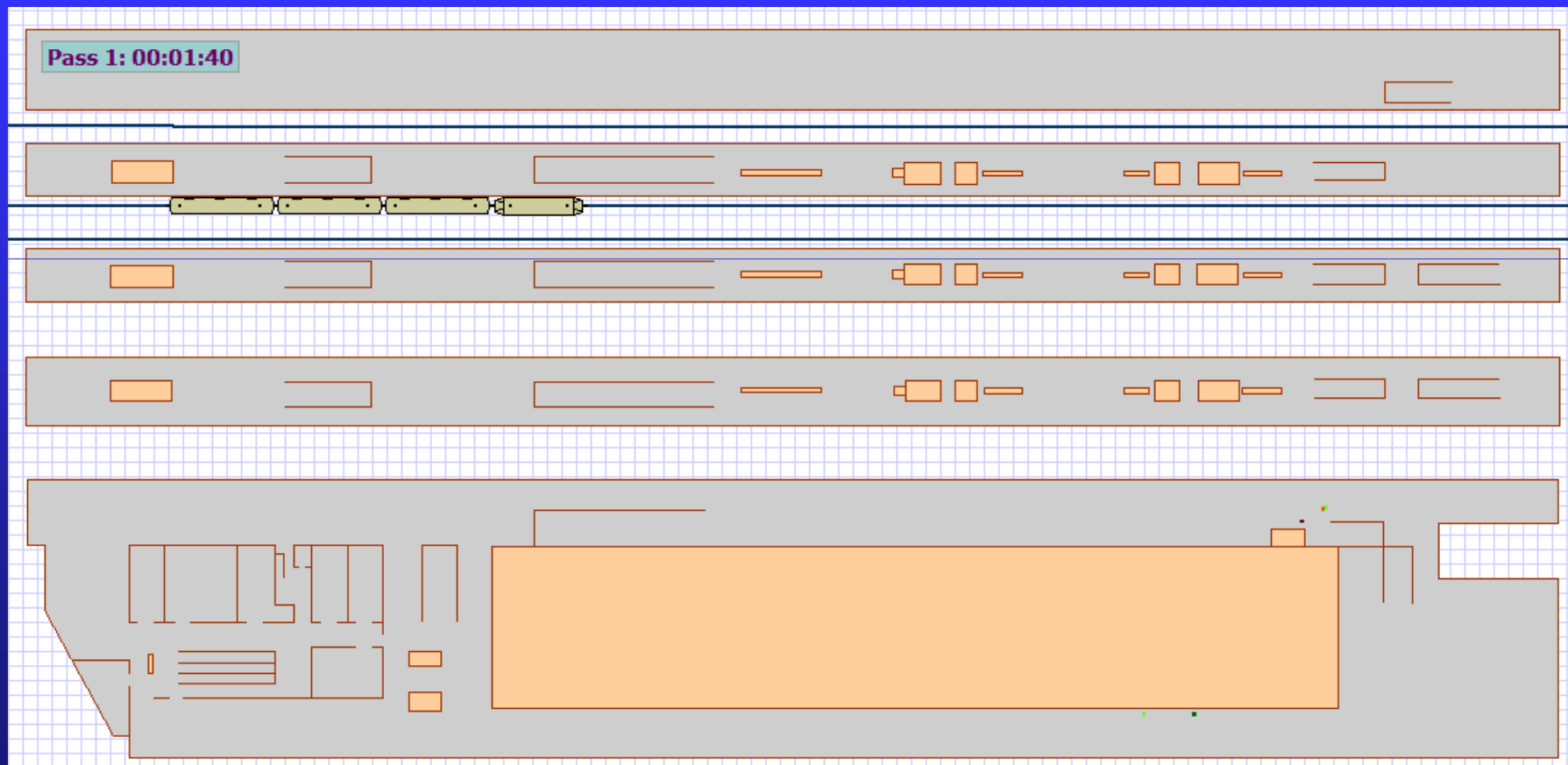


Alex Schmid, Savannah Simulations AG

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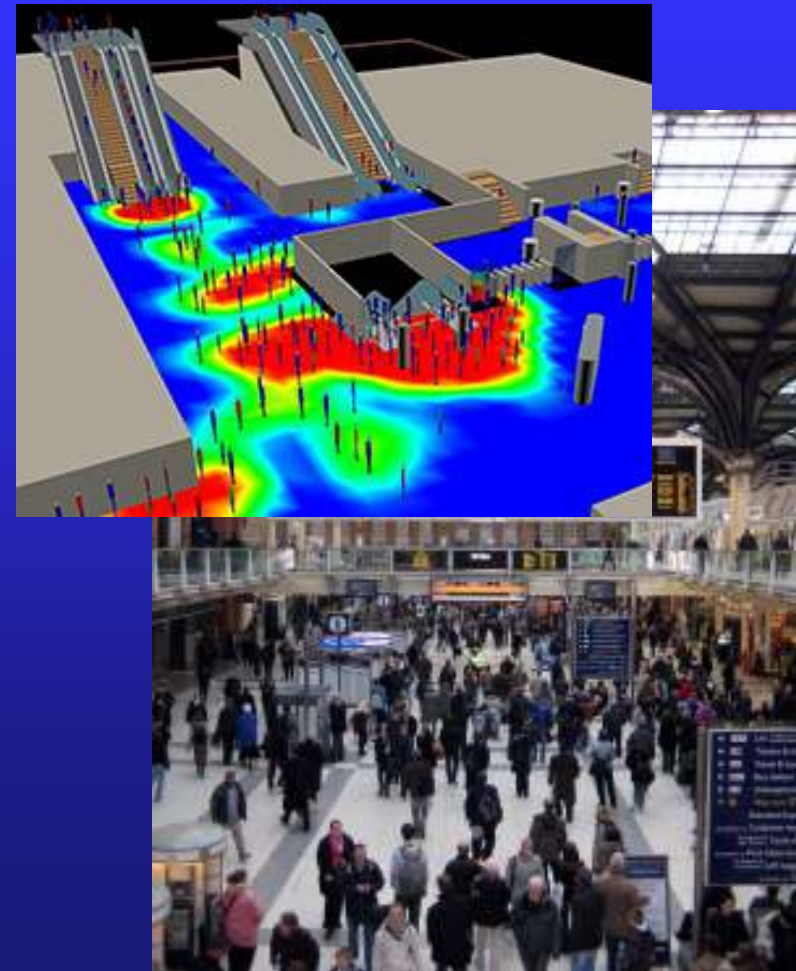
- SimWalk Transport and passenger simulation
- Passenger flow simulation in railway stations
- „Two worlds“ – Railway network simulation and passenger simulation
- „Closing the gap“ – Interfacing Opentrack and SimWalk Transport
- Application example

What is Passenger Simulation?



SimWalk Transport and passenger simulation

- State-of-the-art passenger simulation means **microsimulation**, simulating every person as single entity
- Simulated passengers **move realistically** in a station environment
- Simulation allows to analyse station **passenger capacities** and **interfaces**
- SimWalk Transport is a specialised microsimulator for public transport



Passenger flow simulation in railway stations

- What are the passenger flow problems and the benefits of passenger simulation in railway stations?

PROBLEMS:

- Today's ever increasing capacity demands in public transport transit stations put efficient operations and existing facilities at risk.
- Efficient transit connections and transfer times, accurate dwell times for rolling stock, optimized timetables and general passenger security are under pressure due to high passenger volumes.

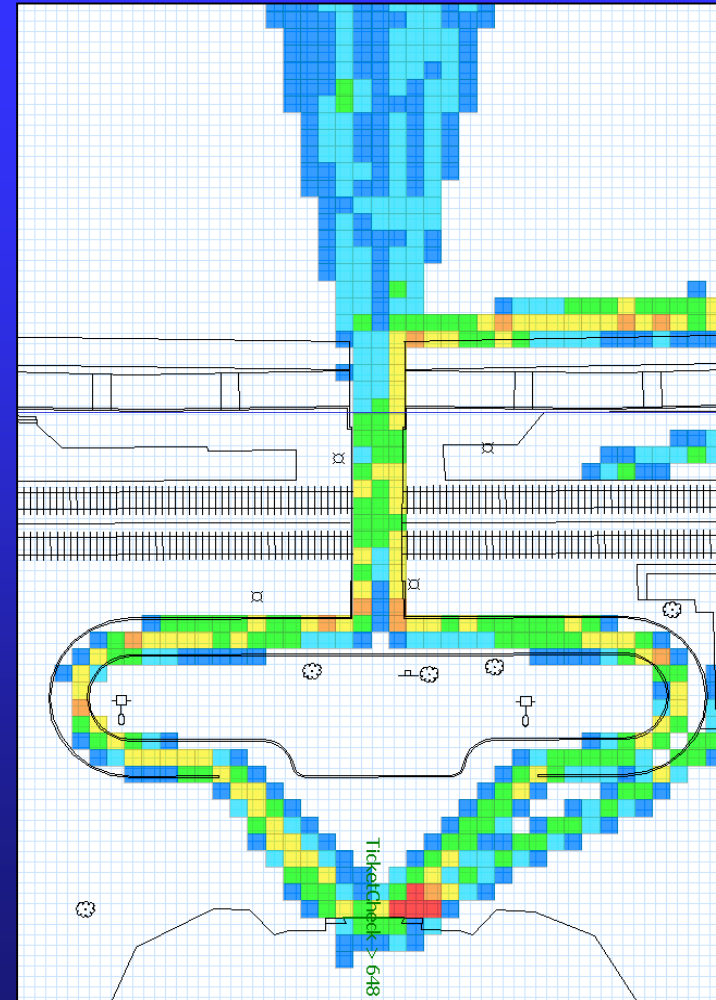
SIMULATION BENEFITS:

- Passenger simulation provides a tool to analyse complex passenger flows and interfaces (boarding/alighting) in railway stations
- Simulation allows to test „what..if“ scenarios to evaluate and possibly improve existing or planned transit facilities regarding passenger flows and objects (escalators, stairs etc.)

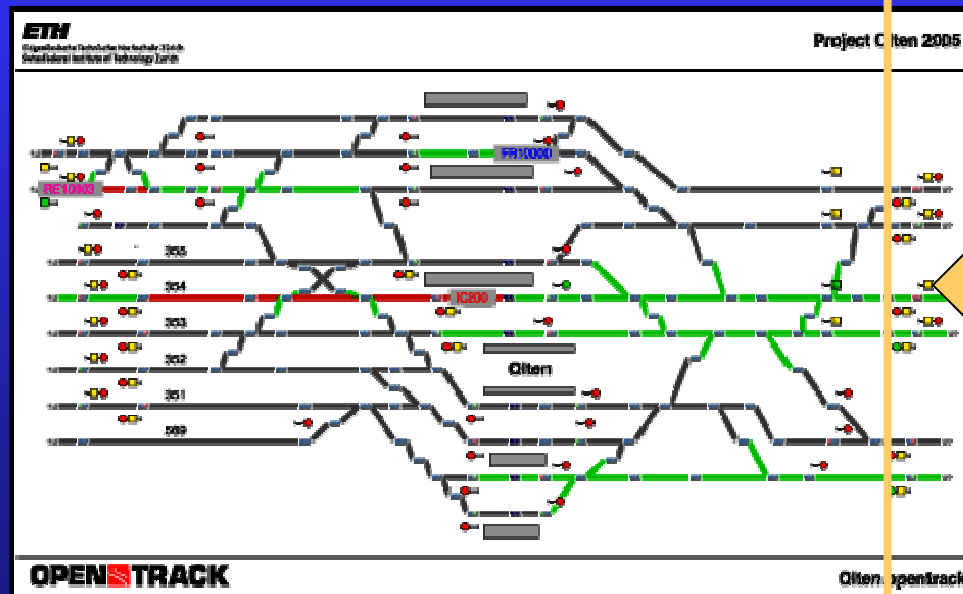


SIMULATION ANALYSIS:

- **Timetable analysis** – are timetables adapted to passenger demand?
- **Dwell time analysis** - are arrival and departure times accurate for passenger dynamics?
- **Analysis of boarding / alighting dynamics**
- **Platform capacity planning**
- **Connection transfer times and delays**
- **Rolling stock analysis**



„Two worlds“ – Railway network simulation and passenger simulation



„Railway Network World“

INTERFACE

Inter-
action

Inter-
depen-
dence



„Passenger world“

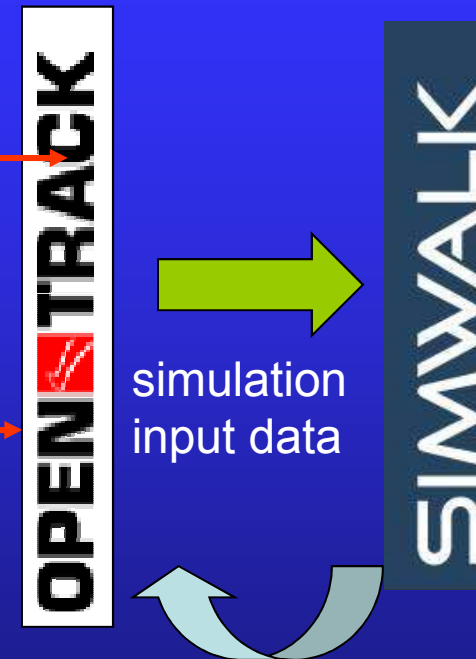
WHAT ARE THE GENERIC INTERFACE PARAMETERS?

- Boarding / alighting dynamics
- Timetables
- Rolling stock capacity
- Planned dwell times (arrival / departure)
- Door and platform properties
- Passenger dynamics on platform
- etc.

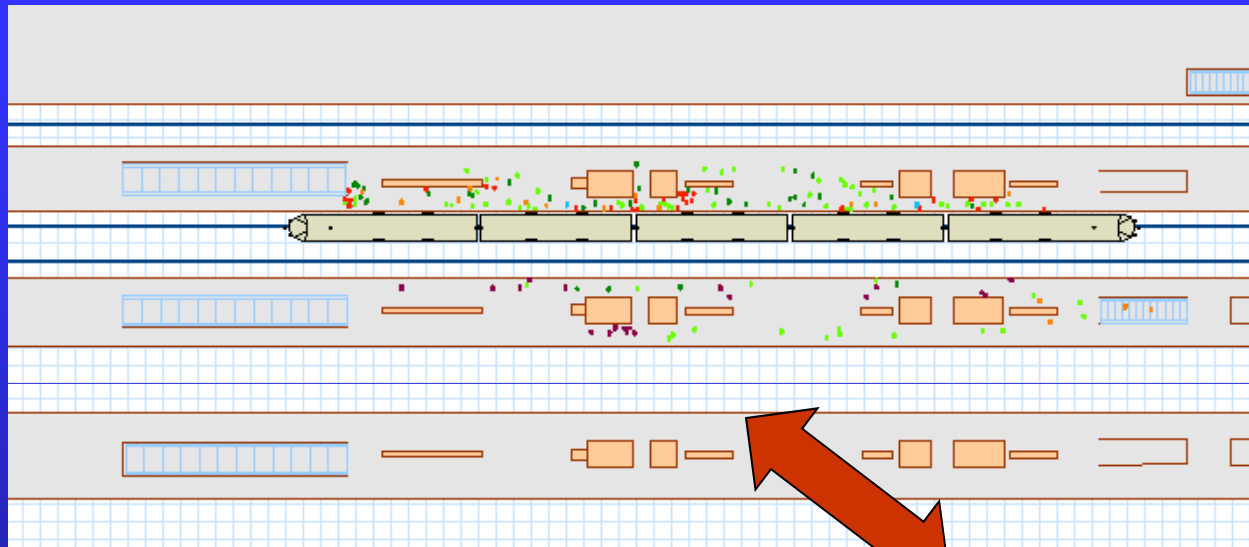


„Closing the gap“ – Interfacing Opentrack and SimWalk Transport

- Boarding / alighting dynamics
- Planned timetables
- Rolling stock capacity
- Simulated dwell times (arrival / departure)
- Door and platform properties
- Passenger dynamics on platform
- etc.



How do Opentrack and SimWalk Transport interface in practice?



SimWalk Transport
passenger simulation
analysis

tion="UST-RUEM" type="planned" dataSource="opentrack">

OpenTrack railway
network simulation
analysis

```

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Import OpenTrack planned and calculated data

```

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```

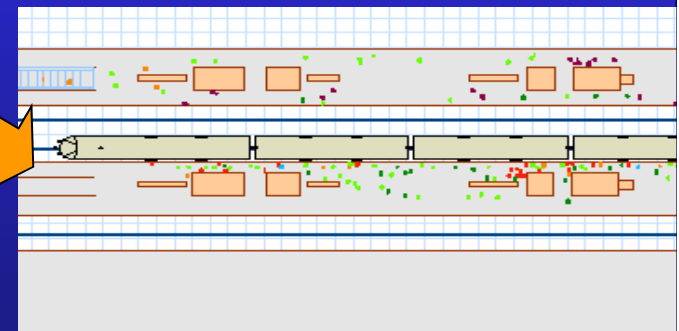
1 OpenTrack RailML data file

For	Planned times	Calculated times	Departure
S7_Zuerich	07:22:30	07:23:30	07:23:30
S7_Zuerich	07:35:00	07:36:00	07:36:00
S7_Zuerich	07:39:00	07:40:30	07:40:30
S7_Zuerich	07:49:00	07:51:00	07:51:00
S7_Zuerich	07:52:30	07:53:30	07:53:30
S7_Zuerich	08:05:00	08:06:00	08:06:00

3 Planned or calculated data

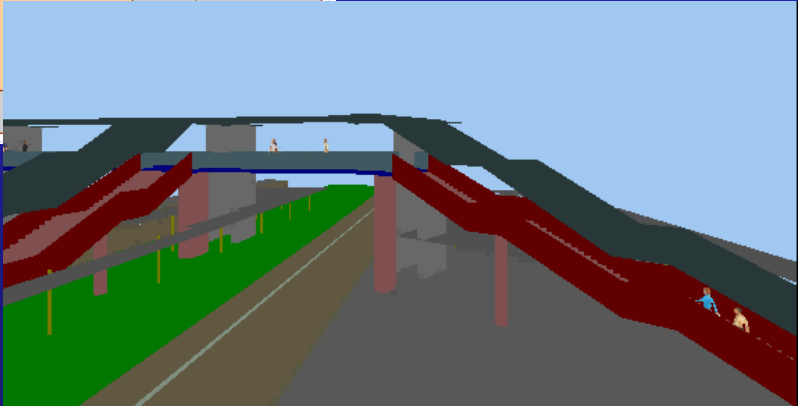
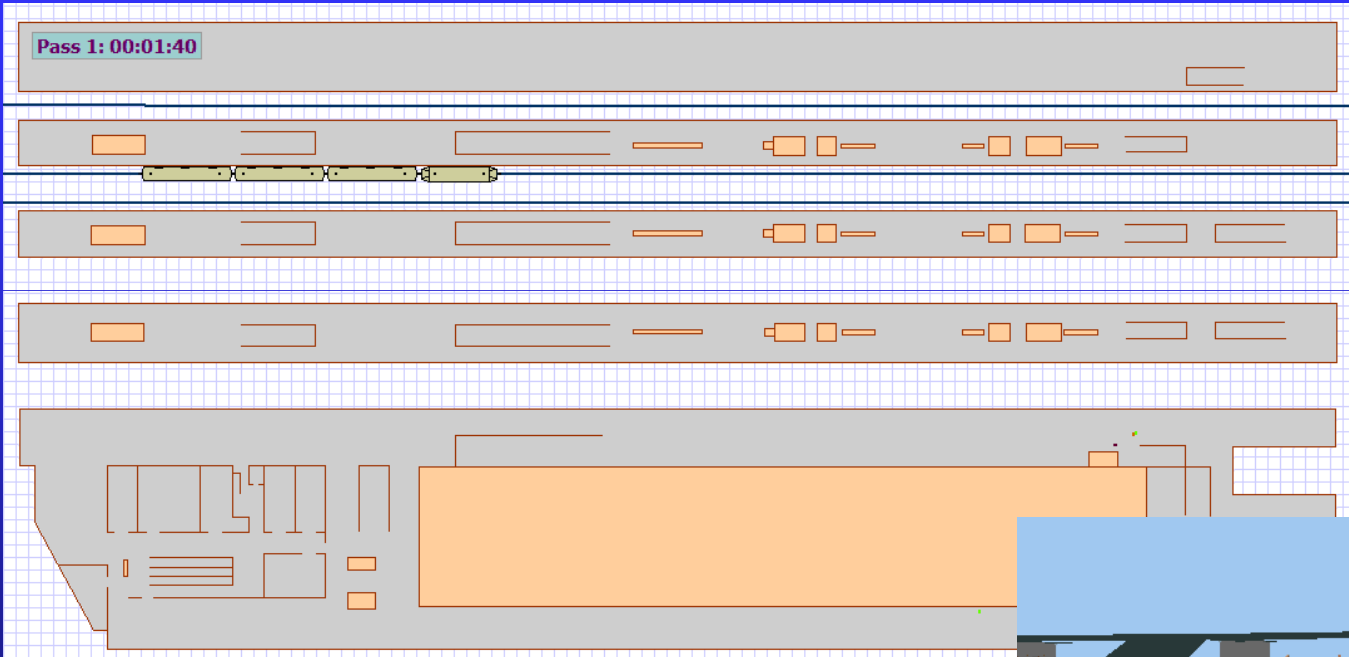
Formation	Arrival	Departure
S7_Zuerich	07:05:00	07:06:00
S7_Zuerich	07:09:00	07:10:30
S7_Zuerich	07:19:00	07:21:00
S7_Zuerich	07:22:30	07:23:30
S7_Zuerich	07:35:00	07:36:00
S7_Zuerich	07:39:00	07:40:30
S7_Zuerich	07:49:00	07:51:00
S7_Zuerich	07:52:30	07:53:30
S7_Zuerich	08:05:00	08:06:00

2 Generation of passengers + definition of train arrival / departure by using OpenTrack data



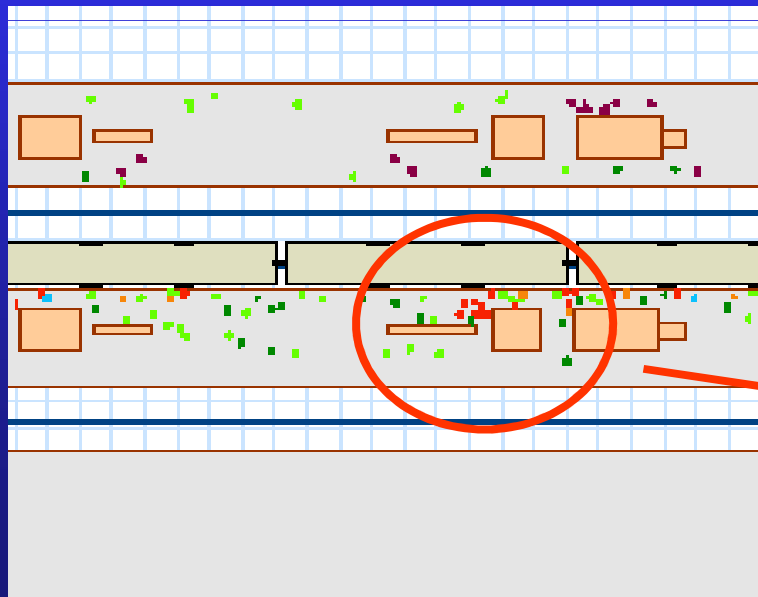
4 Simulation of train and passenger boarding alighting

Simulation with OpenTrack data

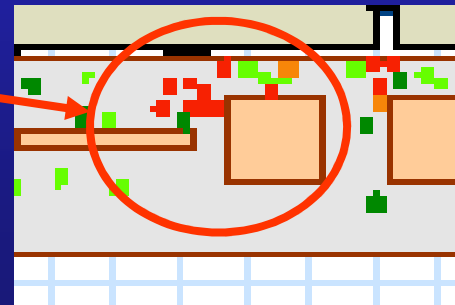


Application example

- Are calculated arrival / departure times sufficient for a train to process all passengers given a certain passenger demand?
- Or: Given a certain occupancy of a train, do passengers have enough time to board the selected train until departure?



- SimWalk Transport allows to analyse the number of people who are not able to board the train, given a certain arrival/departure time and occupancy.



Summary

- The combination of railway network and passenger simulation extends analysis and optimization perspectives regarding the simulation of railway interfaces (platforms, railway stations, passages etc.)
- Integration of passenger simulation allows a more comprehensive and accurate timetable optimization , boarding / alighting as well as rolling stock and environmental analysis
- Passenger simulation allows to analyse and optimize passenger/railway interfaces in operation and planning!

Thank you for your attention
and your questions!

SimWalk Transport trial version can be
downloaded at www.simwalk.com